Package ‘AdaptFitOS’

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Title Adaptive Semiparametric Regression with Simultaneous Confidence Bands

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Author Manuel Wiesenfarth and Tatyana Krivobokova

Maintainer Manuel Wiesenfarth <m.wiesenfarth@dkfz.de>

Depends SemiPar, nlme, MASS, mgcv

Suggests splines

Description Based on the function `asp` of the AdaptFit package fits semiparametric regression models with spatially adaptive penalized splines and computes simultaneous confidence bands.

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AdaptFitOS-package

Adaptive Semiparametric Regression with Simultaneous Confidence Bands

Description

Based on package AdaptFit (which is itself based on the SemiPar package) fits semiparametric regression models with spatially adaptive penalized splines and computes simultaneous confidence bands.

Particular differences to AdaptFit include the availability of simultaneous confidence bands and B-spline basis functions and different functionality of the plot function. However, random effects, autocorrelations and interaction surfaces are not supported. Further, only Gaussian responses are supported. Note that in contrast to AdaptFit and SemiPar, estimated curves are centered to have zero mean. Furthermore, unlike in package SemiPar, dummies for categorical covariates are constructed automatically if a variable is given as factor. and unlike SemiPar, categorical covariates are automatically detected. For computation of the critical value for simultaneous confidence bands based on Hotelling’s volume-of-tube formula, some functions of the libtube library by Catherine Loader (see package locfit) are used. See the references for details on the construction of the confidence bands.

Details

Package: AdaptFitOS
Version: 0.42
Date: 2012-06-03
Depends: SemiPar, MASS, nlme, cluster

Index:

asp2 Fit a semiparametric regression model with spatially adaptive penalized
aspFormula An asp formula
aspHetero Estimate varying residual variance
fitted.asp Fitted values for semiparametric regression.
plot.asp Plots fitted curves or their derivatives including simultaneous confidence bands
plot.scbm Plots fitted curves in a scbm object including simultaneous confidence bands
predict.asp Semiparametric regression prediction.
residuals.asp Residuals for semiparametric regression.
scbM Calculate simultaneous confidence bands for penalized splines
summary.asp Semiparametric regression summary
The function `asp2()` is used to fit the model. Using the resulting `asp` object, fitted curves or their derivatives can be plotted with `plot.asp` and information on the parametric effects can be printed using `summary`.

**Author(s)**

Manuel Wiesenfarth and Tatyana Krivobokova

Maintainer: Manuel Wiesenfarth <m.wiesenfarth at dkfz de>

**References**


*SemiPar 1.0 Users’ Manual.*


**See Also**

`smp` (package SemiPar), `asp` (package AdaptFit)

---

**Description**

Fits semiparametric regression models using the mixed model representation of penalized splines with spatially adaptive penalties based on the `asp` function of the AdaptFit-package (which is based on `spm` function of SemiPar package). Particular differences to AdaptFit include the availability of simultaneous confidence bands and B-spline basis functions and different functionality of the `plot` function. However, random effects, autocorrelations and interaction surfaces are not supported. Further, only Gaussian responses are supported. Note that in contrast to AdaptFit and SemiPar, estimated curves are centered to have zero mean.

**Usage**

```r
asp2(form, spar.method = "REML", contrasts=NULL, 
omit.missing = NULL, returnFit=FALSE, 
niter = 20, niter.var = 50, tol=1e-6, tol.theta=1e-6, 
control=NULL)
```
Arguments

form
a formula describing the model to be fitted. See aspFormula for further information. Note, that an intercept is always included, whether given in the formula or not.

spar.method
method for automatic smoothing parameter selection. May be "REML" (restricted maximum likelihood) or "ML" (maximum likelihood).

contrasts
an optional list. See the contrasts.arg of model.matrix.default.

omit.missing
a logical value indicating whether fields with missing values are to be omitted.

niter
a maximum number of iterations for the mean estimation, default is 20.

niter.var
a maximum number of iterations for the variance of random effects estimation, default is 50.

tol
tolerance for the convergence criterion. Default is 1e-6.

tol.theta
tolerance for the convergence criterion (smoothing parameter function routine). Default is 1e-6.

returnFit
a logical value indicating whether the fitted object should be returned when the maximum number of iterations is reached without convergence of the algorithm. Default is FALSE.

control
see lmeControl in the documentation to nlme.

Value

A list object of class asp containing the fitted model. The components are:

fitted
fitted values.

coeff.mean
estimated mean coefficients.

design.matrices
design matrices both for knots and subknots.

x
x values.

knots
knots.

y.cov
estimated covariance matrix of the response.

random.var
estimated covariance matrix of the random effects.

subknots
subknots.

coeff.random
estimated spline coefficients of the covariance matrix of the random effects.

var.random.var
estimated variance of the spline coefficients of the covariance matrix of the random effects.

fit
mimics fit object of lme().

info
information about the inputs.

aux
auxiliary information such as variability estimates.

Author(s)

Manuel Wiesenfarth <m.wiesenfarth at dkfz.de>, Tatyana Krivobokova <tkrivob at gwdg.de>
References


*Semiparametric Regression* Cambridge University Press.
http://stat.tamu.edu/~carroll/semiregbook/

Direct Simultaneous Inference in Additive Models and its Application to Model Undernutrition.

See Also

`gam` (in package ‘mgcv’), `asp` (in package ‘AdaptFit’), `lme` (in package ‘nlme’)

Examples

```r
## Not run:

### Examples as in package `AdaptFit`

### scatterplot smoothing

```c
x <- 1:1000/1000
mu <- exp(-400*(x-0.6)^2)+ 5*exp(-500*(x-0.75)^2)/3+2*exp(-500*(x-0.9)^2)
y <- mu+0.5*rnorm(1000)

# fit with default knots
y.fit <- asp2(y=f(x,adap=TRUE))
plot(y.fit,residuals=TRUE,lwd=2,scb.lwd=2,scb.lty="dashed")
  # with shaded confidence region.
  # Use scb.lty="blank" to plot the shades only.
  plot(y.fit,residuals=TRUE,shade=TRUE,scb.lty="blank")

### one more scatterplot smoothing with specified knots and subknots

```c
x <- 1:400/400
mu <- sqrt(x*(1-x))*sin((2*pi*(1+2*((9-46)/5)))/(x+2*((9-46)/5)))/(x+2*((9-46)/5))
y <- mu+0.2*rnorm(400)

kn <- default.knots(x,80)
kn.var <- default.knots(kn,20)

y.fit <- asp2(y=f(x,knots=kn))
y.fit2 <- asp2(y=f(x,knots=kn.var,knots=kn.var,adap=TRUE))

op <- par(mfrow = c(1, 2))
plot(y.fit)
plot(y.fit2)
par(op)

### additive models

```c
x1 <- 1:300/300
x2 <- runif(300)
```
mu1 <- exp(-400*(x1-0.6)^2)+
  5*exp(-500*(x1-0.75)^2)/3+2*exp(-500*(x1-0.9)^2) 
mu2 <- sin(2*pi*x2) 
y2 <- mu1+mu2+0.3*rnorm(300) 

y2.fit <- asp2(y2~f(x1,adapt=TRUE)+f(x2,adapt=TRUE)) 
# switch off adaptive fitting for the first function 
y21.fit <- asp2(y2~f(x1,adapt=FALSE)+f(x2,adapt=TRUE)) 

op <- par(mfrow = c(2, 2)) 
plot(y2.fit) 
plot(y21.fit) 
par(op) 

# Use predict to avoid centering of smooths in case of scatterplot 
# smoothing 
library(SemiPar) 
data(fossil) 
attach(fossil) 
fit <- asp2(strontium.ratio~f(age,basis="tps",adapt=FALSE)) 
newdata.age <- data.frame(age=seq(90,130,length.out=50) ) 
preds <- predict(fit,newdata=newdata.age,se=FALSE) 
plot(age,strontium.ratio) 
lines(newdata.age$age,preds,col="red") 

beta=function(l,m,x) 
  return(gamma(l+m)/(gamma(l)*gamma(m))^-(-1)*x^(l-1)*(1-x)^(m-1)) 

f1 = function(x) return((0.6*beta(30,17,x)+0.4*beta(3,11,x))*1/0.958) 
f2 = function(x) return((sin(2*pi*(x-0.5))^2)*1/.3535) 
f3 = function(z) return((exp(-400*(z-0.6)^2)+
  5/3*exp(-500*(z-0.75)^2)+2*exp(-500*(z-0.9)^2))*1/0.549) 

set.seed(1) 
N <- 500 
x1 = runif(N,0,1) 
x2 = runif(N,0,1) 
x3 = runif(N,0,1) 

kn1 <- default.knots(x1,40) 
k2 <- default.knots(x2,40) 
k3 <- default.knots(x3,40) 
kn.var3 <- default.knots(kn3,5) 

y <- f1(x1)+f2(x2)+f3(x3)+0.3*rnorm(N) 

# semiparametric model 
fit1= asp2(y~x1+f(x2,basis="bs",degree=3,knots=kn2,adapt=FALSE) 
  +f(x3,basis="bs",degree=3, 
  knots=kn3,var.knots=kn.var3,adapt=FALSE),
summary(fit1)
plot(fit1, pages=1)

# all effects flexible
# fit model with all smoothing parameters constant
fit2a <- asp2(y=f(x1), basis="os", degree=3, knots=kn1, adap=FALSE)
  + f(x2, basis="os", degree=3, knots=kn2, adap=FALSE)
  + f(x3, basis="os", degree=3, knots=kn3, adap=FALSE),
    niter = 20, niter.var = 200)
plot(fit2a, pages=1)

# fit model with last smoothing parameter adaptive
fit2b <- asp2(y=f(x1), basis="os", degree=3, knots=kn1, adap=FALSE)
  + f(x2, basis="os", degree=3, knots=kn2, adap=FALSE)
  + f(x3, basis="os", degree=3, knots=kn3, adap=TRUE, var.knots=kn.var3, var.basis="os", var.degree=3),
    niter = 20, niter.var = 200)

# plot smoothing parameter function for covariate x3.
# Note that in the case of B-splines additional knots are added,
# see references.
plot(seq(0,1,long.out=42), fit2b$y$ covOfit2b$random.var[85:126],
  ylab=expression(lambda(x3)), xlab="x3", type="l", lwd=3)

# compute 95
# You could skip this and use "fit2b" instead of "scb2b" later on, however,
# if N is large, computing the SCBs various times can take some time
# if you don't need fitted values and bounds for all covariate points
# (can be computationally intensive due to large matrix dimensions),
# set calc.stdev=F such that these are not computed.
scb2b <- scbM(fit2b, calc.stdev=FALSE)
plot(scb2b, pages=1)

# only fit(x2).
plot(scb2b, select=2, mfrow=c(1,1), lwd=3, ylab="f(x2)", xlab="x2")
# plot.scbm (and plot.asp) returns fitted values and confidence limits,
# if you only need the returned object set plot=FALSE
pscb <- plot(scb2b, plot=FALSE)

# add pointwise confidence intervals to the plot
polygon(c(pscb$grid.x[[2]], rev(pscb$grid.x[[2]])),
  c(pscb$fitted[[2]]+1.96*pscb$Stdev[[2]],
    rev(pscb$fitted[[2]]-1.96*pscb$Stdev[[2]])),
  col = grey(0.85), border = NA)
lines(pscb$grid.x[[2]], pscb$lcb[[2]], lty="dotted", lwd=3)
lines(pscb$grid.x[[2]], pscb$ucb[[2]], lty="dotted", lwd=3)

# plot first derivative of f(x1)
scb2bdrv <- scbM(fit2b, drv=1, calc.stdev=FALSE)
plot(scb2bdrv, select=1)
# the following would give the same result
Description

A formula to be used in asp2. The formula is close to the one used in asp of package AdaptFit.

Unlike in package SemiPar, dummies for categorical covariates are constructed automatically if a variable is given as factor (with contrasts as set by options("contrasts") or specified by a list in argument contrasts). Note that only parametric interactions are supported and that interacting covariates have to be multiplied beforehand and given as a new variable in the formula. Smooth terms are given by

\[ f(x, \text{basis}="os", \text{degree}=3, \text{knots}, \text{var.knots}, \text{var.basis}, \text{var.degree}, \text{adap}=\text{TRUE}) \]

with the following arguments:

Arguments

- **x**
  - the covariate
- **basis**
  - the spline basis function to be used. "trunc.poly" for truncated polynomials, "tps" for thin plate splines and "os" for B-splines. The use of B-splines is recommended. Note that in contrast to packages SemiPar and AdaptFit, "os" is the default.
- **degree**
  - the degree of the basis. In the case of B-splines also a vector of the form \((p,q)\) with \(p\) the B-spline degree and \(q\) the penalty order (the integrated \(q\)-th squared derivative is penalized, see references). If only a scalar is given \(q\) is chosen such that \(p=2q-1\). Defaults are degree=3 (basis="tps"), degree=1 (basis="trunc.poly") and degree=c(3,2) (basis="os"), respectively.
- **knots**
  - the knots to be used. Using e.g. \(\text{kn=\text{default.knots}(x,40)}\) beforehand leads to 40 quantile based knots in the case of "tps" and "trunc.poly" bases. In the case of B-splines ("os"), knots are always equidistant and are automatically generated with the number equal to the length of the vector of knots given plus boundary knots. If no knots are given the number of knots is automatically chosen to be equal to \(\text{floor(n/max(4, floor(n/35)) - 1)}\).
- **adap**
  - TRUE for spatially adaptive smoothing parameter
- **var.knots**
  - the knots for the spline basis for adaptively estimating the smoothing parameter. Note that in package AdaptFit "var.knot" (i.e. without "s") is used instead. If missing the number of knots is automatically chosen to be equal to \(\text{floor(knots/max(4, floor(knots/35)) - 1)}\).
Estimate varying residual variance

Description
Estimates a varying residual variance on basis of an asp object.

Usage
asphetero(object, xx, nknots=5, knots=NULL, basis="os",
           degree=c(3,2), tol=1e-8, niter=100, niter.var=250)

Arguments
- object: an asp object.
- xx: the covariate.
- nknots: the number of knots. Does not apply when knots are given.
- knots: the knots. Does not apply if basis="os". Otherwise, if NULL nknots equidistant knots are used.
- basis: the spline basis: "os" (default), "trunc.poly" or "tps".
- degree: the spline degree (and penalty order in case of B-splines). Defaults to c(3,2).
- tol: tolerance for the convergence criterion. Default is 1e-8.
- niter: a maximum number of iterations for residual variance function estimation, default is 100.
- niter.var: a maximum number of iterations for the variance of random effects estimation within the residual variance function estimation routine, default is 250.

Value
An object of class asp with varying variances, with additional element sigmax including information on the spline of the varying variance.
Author(s)

Manuel Wiesenfarth <m.wiesenfarth at dkfz de>

References


Examples

```r
## Not run:
attach(mcycle)

y< accel
kn1 <- default.knots(times,20)
# fit model with constant residual variance
fit< asp2(accel-f(times,basis="os",degree=3,knots=kn1,adap=FALSE),
niter = 20, niter.var = 200)

# fit model with varying residual variance
fit<aspHetero(fit,times,tol=1e-8)
op <- par(mfrow = c(1,3))
plot(fit);plot(fit)
#sigma() returns the fitted varying residual variance
plot(sort(times),sigma(fit)[order(times)],type="l")
par(op)

## End(Not run)
```

---

**fitted.asp**

*Fitted values for semiparametric regression.*

**Description**

Extracts fitted values from a semiparametric regression fit object.

**Usage**

```r
## S3 method for class 'asp'
fit<asp(object,...)
```

**Arguments**

- `object`: a fitted asp object as produced by asp2().
- `...`: other possible arguments.
Details

Extracts fitted from a semiparametric regression fit object. The fitted are defined to be the set of values obtained when the predictor variable data are substituted into the fitted regression model.

Value

The vector of fitted.

See Also

plotNasp, predictNasp, summaryNasp, residualsNasp, asp (package AdaptFit)

Examples

```r
## Not run:
library(SemiPar)
data(fossil)
attach(fossil)
fit <- asp2(strontium.ratio~f(age))
plot(fit, bands=FALSE)
points(age,fitted(fit)-fit$coef[1],col="red")

## End(Not run)
```

---

**plot.asp**

Plots fitted curves or their derivatives

Description

Plots fitted curves or their derivatives together with simultaneous confidence bands.

Usage

```r
## S3 method for class 'asp'
plot(x, select=NULL, drv=0, bands=TRUE, level=0.95, grid=50, pages=0,
     plot=TRUE, ylim=NULL, xlab=NULL, ylab=NULL,
     scb.lwd=1, scb.lty="dotted", shade=FALSE, shade.col=grey(0.85),
     residuals=FALSE, residuals.col="steelblue",
     bayes=FALSE, rug=TRUE,...)
```

Arguments

- **x** an asp object
- **select** vector specifying which curves in an additive model should be plotted. If NULL, all curves are plotted.
- **drv** the derivative order. Defaults to 0, i.e. the estimated curves themselves are plotted. First and second derivatives are supported. Does not apply to objects created by `scbM`.  

---
bands TRUE in order to include simultaneous confidence bands.

grid number of points used for the plot, default value 50.

plot if FALSE no plot is given

ylim vector or list of vectors of limits on y axes. If NULL limits are automatically chosen. If multiple curves are plotted and a two-dimensional vector is given, y axes for all curves will be equal. A list with length equal to the number of smooth curves in the model can be given to specify different y-axes for each smooth.

pages The number of pages over which to spread the output as in package mgcv. For example, if pages=1 then all terms will be plotted on one page in an automatic fashion. If pages=0 (default) all graphics settings are left as they are.

level the level of confidence (does not apply to objects created by scbM).

xlab label for the x axis. A list with length equal to the number of smooth curves in the model can be given to specify different labels for each smooth.

ylab label for the y axis. A list with length equal to the number of smooth curves in the model can be given to specify different labels for each smooth.

scb.lwd line width for simultaneous confidence bands

scb.lty line type for simultaneous confidence bands. Use scb.lty="blank", if you only want to plot the shades.

shade set to TRUE to produce shaded regions as simultaneous confidence bands for smooths

shade.col define the color used for shading confidence bands

residuals if TRUE, partial residuals are added to the plot

residuals.col color of partial residuals

rug adds a rug representation (1-d plot) of the data to the plot.

bayes FALSE for simultaneous confidence bands with (approximate) frequentist coverage probability, TRUE for (approximate) Bayesian coverage probability. See Krivobokova et al. (2010) for details.

... further arguments to be passed to plot()

Details

plot.asp() first calls scbM and then plot.scbm() to plot an asp object. If plotting takes long (because of a large data set) and you want to plot multiple times with different settings, use scbM and then plot the resulting scbm object with plot.scbm(). Different to packages SemiPar and AdaptFit, estimated fits are centred to have zero mean. The simultaneous confidence bands have (approximate) frequentist coverage probabilities with automatic bias correction (see references).

Value

grid.x list of the grid values used

fitted list of the fitted values on the grid

lcb list of the lower bounds of the confidence bands
predict.asp

ucb  list of the upper bounds of the confidence bands
drv  the derivative order
Stdev.fit the standard deviations on the grid
ylim list of ylim used for plotting
residuals the partial residuals.

Author(s)
Manuel Wiesenfarth <m.wiesenfarth at dkfz de>

References

See Also
plot.spm in package SemiPar

Examples

# see asp2()

predict.asp  Semiparametric regression prediction.

Description
Takes a fitted asp object produced by asp2 and obtains predictions at new data values.

Usage

## S3 method for class 'asp'
predict(object,newdata,se,...)

Arguments

object  a fitted asp object as produced by asp2().
newdata a data frame containing the values of the predictors at which predictions are required. The columns should have the same name as the predictors. Further, minima and maxima should currently coincide with those of the predictors.
se when this is TRUE standard error estimates are returned for each prediction. The default is FALSE.
...  other arguments.
Details

Takes a fitted asp object produced by asp2() and obtains predictions at new data values as specified by the ‘newdata’ argument. If ‘se=TRUE’ then standard error estimates are also obtained.

Value

If se=FALSE then a vector of predictions at ‘newdata’ is returned. If se=TRUE then a list with components named ‘fit’ and ‘se’ is returned. The ‘fit’ component contains the predictions. The ‘se’ component contains standard error estimates.

Author(s)

Manuel Wiesenfarth, based on implementation of M.P. Wand (package SemiPar).

See Also

plot.asp, summary.asp (package AdaptFit)

Examples

library(SemiPar)
data(fossil)
attach(fossil)
fit <- asp2(strontium.ratio ~ f(age, basis="tps"))
newdata.age <- data.frame(age=c(90,100,110,120,130))
preds <- predict(fit,newdata=newdata.age,se=TRUE)
print(preds)

# Use predict to avoid centering of smooths in case of scatterplot
# smoothing
fit <- asp2(strontium.ratio ~ f(age,basis="tps"))
newdata.age <- data.frame(age=seq(90,130,length.out=50))
preds <- predict(fit,newdata=newdata.age,se=TRUE)
plot(age,strontium.ratio)
lines(newdata.age$age,preds$fit,col="red")
lines(unlist(newdata.age),preds$fit+2*preds$se,col="blue")
lines(unlist(newdata.age),preds$fit-2*preds$se,col="green")
Arguments

object a fitted asp object as produced by asp2().
... other possible arguments.

Details

Extracts residuals from a semiparametric regression fit object. The residuals are defined to be the difference between the response variable and the fitted values.

Value

The vector of residuals.

See Also

plot.asp, predict.asp, summary.asp, fitted.asp
asp (package AdaptFit)

Examples

library(SemiPar)
data(fossil)
attach(fossil)
fit <- asp2(strontium.ratio~f(age))
plot(age,residuals(fit))
abline(0,0)

scbM

Calculate simultaneous confidence bands for penalized splines

Description

Calculates simultaneous (uniform) confidence bands for the mixed model representation of penalized splines based on volume-of-tube formula.

Usage

scbM(object, select=NULL, drv=0, level=0.95, div=1000,
calc.stdev=TRUE, bayes=FALSE)

Arguments

object an asp object.
select vector specifying which curves in an additive model should be considered. If NULL, all curves are considered.
drv the derivative order. Defaults to 0, i.e. the estimated function itself is plotted. First and second derivatives are supported.
level | level of confidence.
div  | precision for the integral used for calculation of the length of the curve, default is 1000.
calc.stdev | TRUE to compute standard deviation and confidence bands for each value of the covariates. Computationally intensive for large data sets. Use plot.scbm() or plot.asp() to compute standard deviation and bounds only for a grid. If FALSE only critical values are computed.
bayes | FALSE for confidence bands with (approximate) frequentist coverage probability, TRUE for (approximate) Bayesian coverage probability. See Krivobokova et al. (2010) for details.

Details

Returns a scbm object and prints critical values. The resulting confidence bands have (approximate) frequentist coverage probabilities with automatic bias correction (see references). Makes use of the libtube library by Catherine Loader (see package locfit).

Value

A list object of class scbm containing

- asp.object: an asp object.
- drv: the derivative order.
- crit: a list of critical values.
- sigma2: the variance of the residuals.
- cov.coef: a list of covariance matrices of spline coefficients in the mixed model framework.
- stdev: the standard deviations of estimates. Only given if calc.stdev=TRUE.
- fitted: a list of fitted values. Only given if calc.stdev=TRUE.
- lcb: a list of lower bounds of confidence bands. Only given if calc.stdev=TRUE.
- ucb: a list of upper bounds of confidence bands. Only given if calc.stdev=TRUE.
- ...: further

Author(s)

Manuel Wiesenfarth <m.wiesenfarth at dkfz de>, Tatyana Krivobokova <tkrivob at gwdg de>

References


Examples

## Not run:

```r
beta=function(l,m,x)
return((gamma(l+m)*(gamma(l)*gamma(m)))^(-1)*x^((l-1)*(1-x)*(m-1)))

f1 = function(x) return((0.6*beta(30,17,x)+0.4*beta(3,11,x))*x/0.958)

f2 = function(x) return((sin(2*pi*(z-0.5))^2)*1/.3535)

f3 = function(z)
return((exp(-400*(z-0.6)^2)+5/3*exp(-500*(z-0.75)^2)+2*exp(-500*(z-0.9)^2))*x/0.549)

center=function(x) return(x-mean(x))

set.seed(1)
N <- 500
x1 = runif(N,0,1)
x2 = runif(N,0,1)
x3 = runif(N,0,1)

kn1 <- default.knots(x1,40)
k22 <- default.knots(x2,40)
k33 <- default.knots(x3,40)
kn.var3 <- default.knots(kn3,5)

y <- f1(x1)+f2(x2)+f3(x3)+0.3*rnorm(N)

# fit model with last smoothing parameter adaptive
fit2b= asp2zy=f(x1, basis="os", degree=3, knots=kn1, adap=FALSE)
+f(x2, basis="os", degree=3, knots=kn2, adap=FALSE)
+f(x3, basis="os", degree=3, knots=kn3, adap=TRUE,
var.knots=kn.var3, var.basis="os", var.degree=3),
niter = 20, niter.var = 200)

# compute 95
# You could skip this and use "fit2b" instead of "scb2b" later on,
# however, if N is large, computing the SCBs various times can take
# some time if you don't need fitted values and bounds for all covariate points
# (can be computationally intensive due to large matrix dimensions),
# set calc.stdev=F such that these are not computed.
scb2b<- scbM(fit2b,calc.stdev=FALSE)
plot(scb2b,pages=1)

# plot first derivative of f(x1)
scb2bdrv<- scbM(fit2b,drv=1,calc.stdev=FALSE)
plot(scb2bdrv,select=1)
#the following would give the same result
#plot(fit2b,select=1,drv=1)
#different style
plot(scb2bdrv,select=1,scb.lty="blank", shade=TRUE,
shade.col="steelblue")
```

## End(Not run)
sigma

Extract estimated varying residual variance

Description

Extracts the estimated varying residual variance on basis of an object created by aspHetero().

Usage

sigma(object)

Arguments

object an object created by aspHetero().

Author(s)

Manuel Wiesenfarth <m.wiesenfarth at dkfz.de>

Examples

# see aspHetero()

summary.asp

Semiparametric regression summary

Description

Takes a fitted asp object produced by asp2() and summarises the fit. This function is extensively based on the summary function in package SemiPar.

Usage

## S3 method for class 'asp'
summary(object, test1=FALSE, test2=FALSE, signif=0.05, ...)

Arguments

object a fitted asp object as produced by asp2().
test1 TRUE in order to include a test for significance of a nonparametrically estimated effect. The test corresponds to checking whether the zero line is entirely inside the simultaneous confidence band.
test2 TRUE in order to include the nonparametric specification test proposed in Wiesenfarth et al. (2012). Only works with B-splines. The function under the null hypothesis is a polynomial of degree q-1 where q is the penalty order.
signif the significance level.
... other arguments.
Details

Produces tables for the linear (parametric) and non-linear (nonparametric) components. The linear table provides coefficient estimates, standard errors and p-values. The non-linear table provides degrees of freedom values and other information.

Value

The function generates summary tables.

References

Semiparametric Regression Cambridge University Press.
http://stat.tamu.edu/~carroll/semiregbook/

SemiPar 1.0 Users' Manual.

Direct Simultaneous Inference in Additive Models and its Application to Model Undernutrition.

See Also

plot.asp, predict.asp
asp (package AdaptFit)

Examples

## Not run:
library(SemiPar)
data(onions)attach(onions)
log.yield <- log(yield)
fit <- asp2(log.yield~location+f(dens, degree=c(3,2)))
summary(fit,test1=TRUE,test2=TRUE)

## End(Not run)
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